

What is claimed is:

Sub 917

1. An apparatus for catalyzing a reaction on a substrate comprising:
a light source;
a micromirror positioned to redirect light from said light source toward said substrate;
5 a computer connected to, and controlling, said micromirror; and
a reaction chamber is placed in the path of light redirected by said micromirror,
wherein light that is redirected by said micromirror catalyzes a chemical reaction proximate
said substrate in said reaction chamber.

09326526-06049
1564090-9299260

10 2. The apparatus of claim 1 wherein said light source is a UV light.

3. The apparatus of claim 1 wherein said light source produces visible light.

15 4. The apparatus of claim 1 further comprising a lens between said micromirror and said
substrate.

5. The apparatus of claim 4 wherein said lens is further defined as a lens system, and
wherein said lens system can change the magnification of light reflected by said micromirror.

20 6. The apparatus of claim 1 wherein said micromirror is further defined as a micromirror
array.

7. The apparatus of claim 1 further comprising a diffusion lens between said light source and said micromirror.

8. The apparatus of claim 1 wherein said light interacts with a novolak resin proximate said substrate to produce a photoresist pattern.

9. The apparatus of claim 1 wherein said light catalyzes the synthesis of a nucleotide base proximate said substrate.

10. The apparatus of claim 1 wherein said light catalyzes the synthesis of an amino acid residue proximate said substrate.

11. The apparatus of claim 1 wherein said light catalyzes a reaction involving a molecule proximate said substrate.

12. The apparatus of claim 1 wherein said light crosslinks a molecule proximate said substrate.

13. The apparatus of claim 1 further comprising:
a reaction chamber disposed about said substrate;
one or more reactant lines connected to said reaction chamber;
one or more reaction chemicals connected to said reactant lines; and

a computer connected to, and controlling, the supply of said one or more reaction chemicals to said reaction chamber via said reactant lines.

14. The apparatus of claim 13 wherein said one or more of said reaction chemicals is involved in a chemical reaction when exposed to light.

15. An apparatus for catalyzing a reaction on a substrate comprising:
a light source;
a micromirror positioned to redirect light from said light source toward said substrate;
a reaction chamber disposed about said substrate;
one or more reactant lines connected to said reaction chamber;
one or more reaction chemicals connected to said reactant lines; and
a computer connected to, and controlling, said micromirror and the supply of said one or more reaction chemicals to said reaction chamber via said reactant lines, wherein a light catalyzable reaction occurs proximate to the site where light produced by said light source and redirected by said micromirror strikes said substrate.

16. The apparatus of claim 15 wherein said light source is a UV light.

17. The apparatus of claim 15 wherein said light source produces visible light.

18. The apparatus of claim 15 wherein said light source is a xenon lamp, or a mercury lamp, or a laser or a combination thereof.

19. The apparatus of claim 15 further a lens system comprising:
5 a diffusion lens between said light source and said micromirror; and
a lens between said micromirror and said substrate.

20. The apparatus of claim 15 wherein said micromirror is further defined as a micromirror array.

21. The apparatus of claim 15 wherein said light interacts with a novolak resin proximate said substrate to produce a photoresist pattern.

11
~~22.~~ The apparatus of claim ⁵~~15~~ wherein said light catalyzes the synthesis of a nucleotide
15 base proximate said substrate.

12
~~23.~~ The apparatus of claim ⁵~~15~~ wherein said light catalyzes the synthesis of an amino acid
residue proximate said substrate.

13
20 ~~24.~~ The apparatus of claim ⁵~~15~~ wherein said light catalyzes a reaction involving a
molecule proximate said substrate.

¹⁴
~~25~~ The apparatus of claim ⁵~~15~~ wherein said light crosslinks a molecule proximate said substrate.

26. The apparatus of claim 15 further comprising a total internal reflection mirror
5 disposed in a position to redirect light from said light source into said micromirror and from said micromirror array toward said substrate.

Sub
C2
27. The apparatus of claim 15 wherein said substrate is mounted on a movable platform that can be controlled via a computer to allow for multiple repetitive exposures of said substrate to light reflected by said micromirror.

28. A method of patterning on a substrate comprising the steps of:
generating a light beam;
illuminating a micromirror with said light beam;
15 redirecting said light beam with said micromirror onto a substrate; and
catalyzing a light sensitive reaction proximate to the surface of said substrate using said redirected light beam in a predetermined pattern.

29. The method of claim 28 further comprising the step of controlling, using a computer,
20 said micromirror.

30. The method of claim 28 wherein said step of redirecting said light beam is accomplished using a micromirror array.

31. The method of claim 28 wherein said illuminating light beam is further defined as a UV light.

32. The method of claim 28, further comprising the step of:
obtaining a substrate; and
depositing a novolak resin on said substrate prior to redirecting said a light beam to pattern said photoresist.

33. The method of claim 28, wherein said step of catalyzing a light sensitive reaction proximate to the surface of said substrate is further defined as patterning a photoresist disposed proximate said substrate.

34. The method of claim 28, further comprising the steps of:
positioning said substrate with a reaction chamber;
flooding said substrate with a light catalyzable reaction chemical; and
exposing said light catalyzable reaction chemical to light using said micromirror to catalyze a chemical reaction at the site where light strikes said substrate.

35. The method of claim 28 wherein said step of catalyzing a light sensitive reaction proximate to the surface of said substrate is further defined as the synthesis of a nucleotide base proximate said substrate.

5 36. The method of claim 28 wherein said step of catalyzing a light sensitive reaction proximate to the surface of said substrate is further defined as the synthesis of an amino acid residue proximate said substrate.

10 37. The method of claim 28 wherein said step of catalyzing a light sensitive reaction proximate to the surface of said substrate is further defined as involving a molecule proximate said substrate.

15 38. The method of claim 28 wherein said step of catalyzing a light sensitive reaction proximate to the surface of said substrate is further defined as crosslinking a molecule proximate said substrate.